



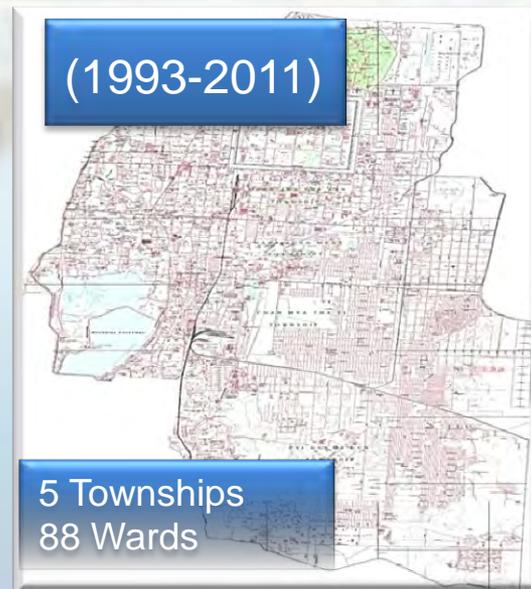
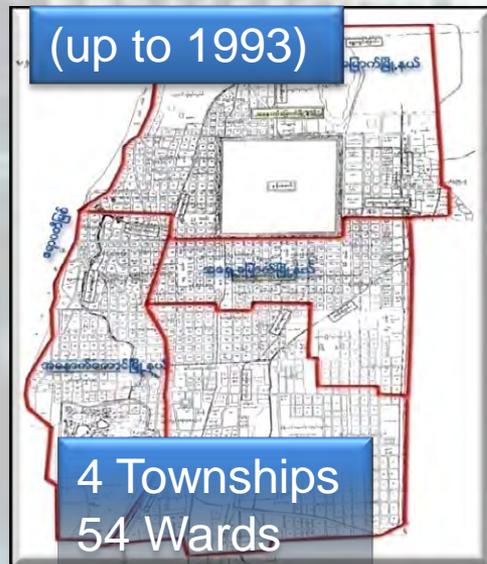
Mandalay City Report on Solid Waste Management



Mandalay City Area



- ❖ Located on the eastern bank of the Ayeyarwady River in the middle portion of the Central Myanmar
- ❖ Composed of six townships namely : Aungmyaytharzan, Chanayetharzan, Mahaaungmyay, Chanmyathasi, Pyigyitagun and Amarapura townships
- ❖ Total area of the City is about 44.59 Square Miles (115.4876 Squares Kilometers)
- ❖ Population is 1.46 millions
- ❖ Mandalay has become one of the most developed economic centre for the commerce, agriculture, industry and tourism.





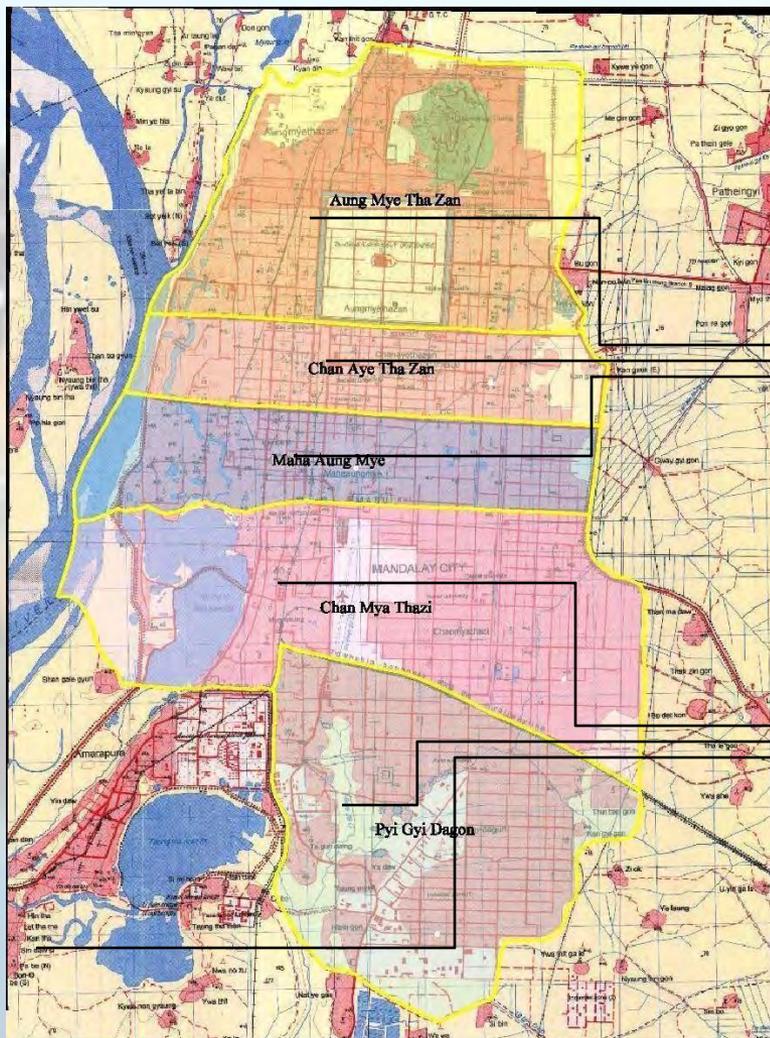
Solid Waste Management

- ❖ Daily refuse generation is gradually increased in these years because of the increasing population, urbanization and economical development
- ❖ Waste generation rate is about 0.4 to 0.45kg/ capita/day
- ❖ Daily collection of waste from the whole city is more than 800 tons
- ❖ Responsible by Cleansing department
- ❖ Cleansing department is currently public ownership and operates vehicles provided by the department of Motor, Transport and Workshop
- ❖ By >2000 of man power using 183 trucks, 153 tri-bikes and > 350 push carts



Final disposal sites

- 17.5 km far from City Hall
- 12.5 Acres collected by purchasing from private owners.
- 450 Tons/day of MSW
- 1.Feb.2010 till now



D1 – Northern dumpsite

Transfer zone

D2 – Southern dumpsite

PRIMARY COLLECTION

- ❖ Door to door collection
- ❖ Container collection
- ❖ Open collection points

SECONDARY COLLECTION

- ❖ Mainly performed on available public area
- ❖ Points within the center of urban areas are located at bus-stations or connection roads and drains
- ❖ Reallocation of secondary collection points into periphery areas is a need
- ❖ Mainly performed with dumpers and closable containers and is very labour intensive



Comparative Statement of Cleansing Department By Yearly



| Year | Waste Collection Tons/day | Workers/ Employee | Collection Vehicles | Tri-bikes |
|------|---------------------------|-------------------|---------------------|-----------|
| 2005 | 259.93 | 911 | 71 | - |
| 2006 | 288.06 | 1172 | 71 | - |
| 2007 | 277.34 | 1196 | 73 | - |
| 2008 | 262.75 | 1085 | 73 | - |
| 2009 | 281.46 | 1021 | 76 | - |
| 2010 | 473.61 | 1140 | 86 | 20 |
| 2011 | 404.23 | 1083 | 116 | 90 |
| 2012 | 550.54 | 1244 | 173 | 150 |
| 2013 | 779.04 | 1942 | 183 | 153 |
| 2014 | 850.00 | 2137 | 183 | 153 |



Vehicles



153 No



350 No



20 No



10 No



138 No

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150 No

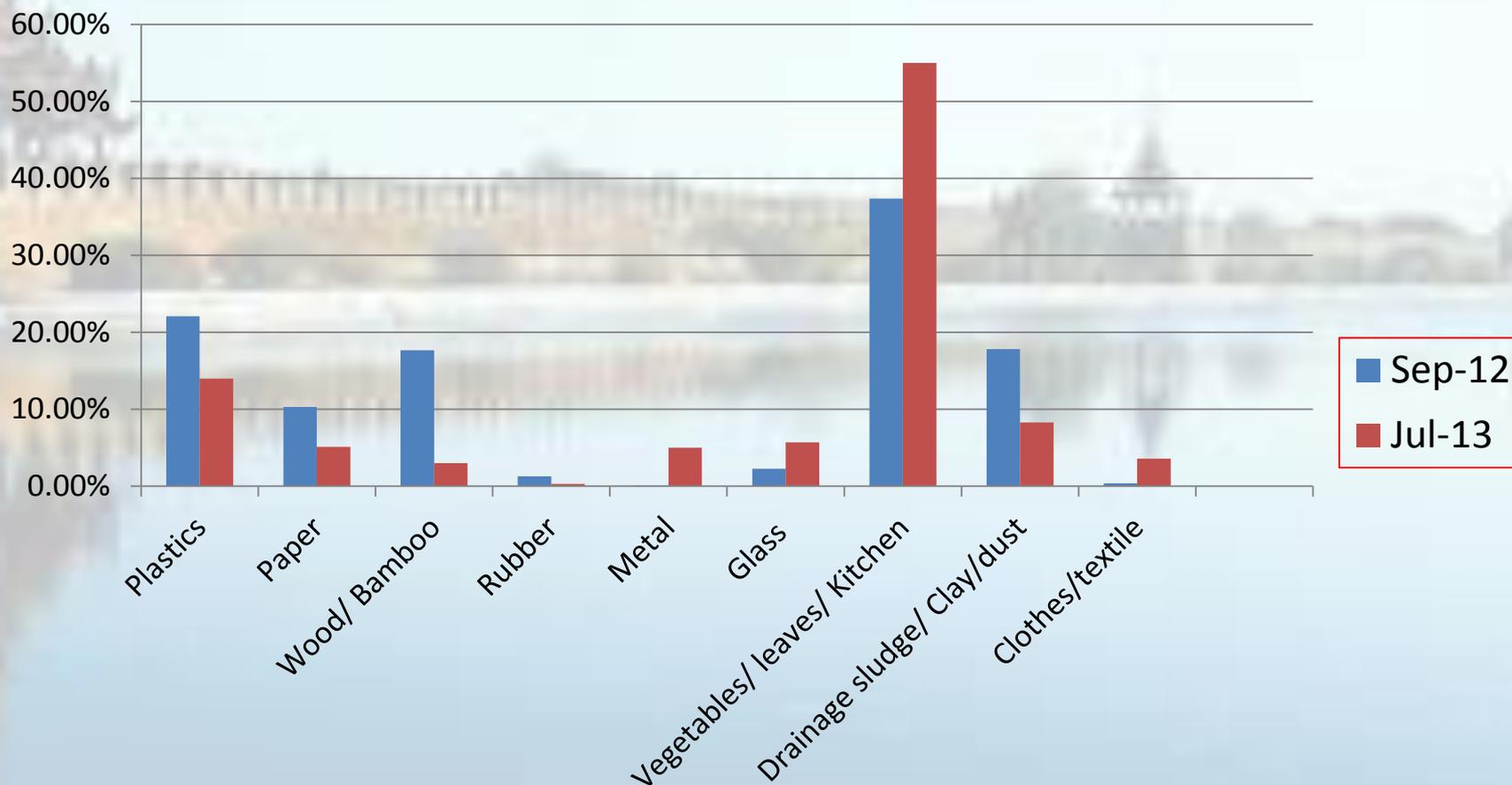


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Waste analyses results in comparison



- **REUSE**

-reuse bottles in factories (private business)



- **RECYCLE (Plastics)**

-recycling the plastic bags and bottles to dust bins, traffic cones, etc.



Collecting



washing



melting



Modeling



products



(MCDC property)



Collecting



Compressing



Smelting



Modeling



Products (iron rods)

- **RECYCLE (Tin and Can) – Private business**



Challenges

- ❖ Co-operation , awareness and active participation of public is still weak in Solid Waste Management system
- ❖ Insufficient budgets, workers, modernized trucks & equipment and improper collecting vehicles
- ❖ Long track from city to landfill areas and less transfer station
- ❖ Increasing population and increasing solid waste generation year by year – migration from other areas and inadequate housing s
- ❖ Public Poverty
- ❖ Increasing roadside shops and illegal tenant
- ❖ No proper staffs training
- ❖ Lack of symposiums, seminars, exhibitions for proper solid waste management
- ❖ Lack of research program for solid waste management
- ❖ Lack of proper town plan for new satellite townships
- ❖ Lack of private organization and company for recyclable products and EPR (extensive product responsibilities)
- ❖ Rodents and insect vectors (due to large no. of communal storage and non-official dump site, existing opening dump site)
- ❖ Weakness to abide by the rules and regulations



FUTURE PLANS

- ❖ To modify existing national policy or to add new rules and regulations for environmental management
- ❖ Now, MCDC and ADB (Asian Development Bank, Japan, Korea development agency, UN-Habitat and Netherlands, Philippine, Thailand, Malaysia companies co-operate the project leading to 'Green City'
- ❖ *REDUCE* - based on segregation of waste in community through education of students and contests
- ❖ *REUSE* – to help private ownerships to become a proper and systematic ones
- ❖ *RECYCLE* - to improve recycle process in both MCDC property and private business
- ❖ Including process of Waste to Energy Project in Mandalay co-operated with Organic Asia Group (Thailand) will start in 2015 and composting



Thank you for your attention